

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

**Listing of Claims:**

1. (Previously presented) Apparatus, comprising a memory entry storing a trace having a multiple-entry, single exit architecture.
2. (Previously presented) The apparatus of claim 1, wherein the trace is a complex trace having multiple independent prefixes and a common, shared suffix.
3. (Previously presented) The apparatus of claim 1, wherein the entry is indexed by an address of a terminal instruction therein.
4. (Previously presented) A front-end system for a processor, comprising:
  - an instruction cache system;
  - an extended block cache system, comprising:
    - a fill unit coupled to the instruction cache system,
    - a block cache,
    - a block predictor to store masks associated with complex blocks, the masks distinguishing block prefixes from each other; and
    - a selector coupled to the output of the instruction cache system and to an output of the block cache.
5. (Previously presented) The front-end system of claim 4, wherein the extended block cache system further comprises a block predictor coupled to the fill unit and the block cache.
6. (Previously presented) The front-end system of claim 4, wherein the block cache is to store blocks having a multiple-entry, single exit architecture.

7. (Previously presented) The front-end system of claim 4, wherein the block cache is to store complex blocks having multiple independent prefixes and a common suffix.
8. (Canceled).
9. (Original) A method of managing extended blocks, comprising:  
predicting an address of a terminal instruction of an extended block to be used,  
determining whether the predicted address matches an address of a terminal instruction of a previously created extended block, and  
selecting one of the extended block in the event of a match.
10. (Original) The method of claim 9, further comprising creating a new extended block when there is no match.
11. (Original) The method of claim 10, wherein the creating comprises:  
receiving new instructions until a terminal condition occurs,  
assembling the new instructions into an extended block,  
determining whether an address of a terminal instruction in the new block matches an address of a terminal instruction of a pre-existing block, and  
unless a match occurs, storing the new block in a memory.
12. (Original) The method of claim 11, wherein the storing comprises, when an older block causes a match, storing the new block over the old block in a memory if the old block is subsumed within the new block.
13. (Original) The method of claim 11, wherein the storing comprises, when an older block causes a match, dropping the new block if the new block is subsumed within the older block.
14. (Original) The method of claim 11, wherein the storing comprises, when an older block causes a match, creating a complex block if the new block and the older block share a common suffix but include different prefixes.
15. (Original) The method of claim 9, further comprising outputting instructions of the selected block for execution.

16. (Previously presented) A processing engine, comprising:  
a front end stage storing blocks of instructions in a multiple-entry, single exit architecture when considered according to program flow, and  
an execution unit in communication with the front end stage.

17. (Currently amended) ~~The processing engine of claim 16~~

A processing engine, comprising:  
a front end stage storing blocks of instructions in a multiple-entry, single exit architecture when considered according to program flow, and  
an execution unit in communication with the front end stage,

wherein the front-end stage ~~comprises:~~ includes  
an instruction cache system,  
an extended block cache system, ~~comprising:~~ including  
a fill unit provided in communication with the instruction cache system,  
a block cache, and  
a selector coupled to the output of the instruction cache system and to an output of the block cache.

18. (Original) The processing engine of claim 17, wherein the block cache is to store the multiple-entry, single exit traces.

19. (Previously presented) The processing engine of claim 17, wherein the extended block cache system further comprises a block predictor coupled to the fill unit and the block cache.

20. (Previously presented) Apparatus, comprising a memory entry storing a sequence of program instructions as a trace, the instructions defining a program flow that progresses from any instruction therein to a last instruction in the memory entry and in which the trace has multiple separate prefixes.

21. (Canceled).

22. (Previously presented) The apparatus of claim 20, wherein the memory entry is indexed by an address of a terminal instruction therein.
23. (Previously presented) A memory comprising storage for a plurality of traces and means for indexing the traces by an address of a last instruction therein according to program flow.
24. (Previously presented) The memory of claim 23, wherein the traces include a plurality of instructions assembled according to program flow.
25. (Previously presented) The memory of claim 24, wherein the traces have a multiple entry, single exit architecture.
26. (Previously presented) The memory of claim 24, wherein at least one trace has separate prefixes and a common suffix, when considered according to program flow.
27. (Previously presented) The memory of claim 24, wherein at least one trace includes at least three segments of executable instructions in which, when considered according to program flow, first and second segments are mutually exclusive of each other and lead into the third segment.
28. (Previously presented) A trace, comprising a sequence of program instruction assembled in order according to program flow, the sequence having a multiple-entry, single exit architecture.
29. (Previously presented) The trace of claim 28, wherein the trace is a complex trace having multiple independent prefixes and a common, shared suffix.
30. (Previously presented) The trace of claim 28, stored in a memory entry, wherein the entry is indexed by an address of a terminal instruction therein.
- 31-37. Canceled.
38. (Currently amended) Apparatus, comprising:  
a memory having at least one memory entry; and

the at least one memory entry to store a trace having a multiple-entry, single exit architecture.

39. (Previously presented) The apparatus of claim 38, wherein the trace is a complex trace having multiple independent prefixes and a common, shared suffix.

40. (Previously presented) The apparatus of claim 38, wherein the entry is indexed by an address of a terminal instruction therein.

41. (Previously presented) Apparatus, comprising:

- a memory entry to store a trace in a single addressable memory location; and
- means for indexing the trace by an address of a last instruction therein according to program flow.

42. (Previously presented) Apparatus, comprising:

- a memory having at least one memory entry;
- the memory entry storing a trace in a single addressable memory location; and
- means for indexing the trace by an address of a last instruction therein according to program flow.

43. (Previously presented) A memory, comprising:

- a trace stored in a single addressable memory location; and
- means for indexing the trace by an address of a last instruction therein according to program flow.